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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/728,910

12/08/2003

Wiley Eugene Hill

H1442

9301

45114

7590

10/29/2004

HARRITY & SNYDER, LLP
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EXAMINER

HO, TU TU V

ART UNIT

PAPER NUMBER

2818

DATE MAILED: 10/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/728,910

Applicant(s)

HILL ET AL.

Examiner

Tu-Tu Ho

Art Unit

2818

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 September 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 7-16 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 and 17-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 12/08/2003.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

DETAILED ACTION

Oath/Declaration

1. The oath/declaration filed on 12/08/2003 is acceptable.

Election/ Restriction

2. Applicant's election without traverse of Invention I, **claims 1-6 and 17-20**, in the reply filed on 09/28/2004 is acknowledged.

3. **Claims 7-16** are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 09/28/2004.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

(e) the invention was described in

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. **Claims 1, 4-6, and 17-19** are rejected under 35 U.S.C. 102(e) as being anticipated by Fried et al. U.S. Patent Application Publication 2003/0102518.

Fried discloses in the figures, particularly Figures 7b and 14, and respective portions of the specification a memory device and a method for forming thereof as claimed.

Referring to **claims 1 and 17**, Fried discloses a memory device and a method for forming thereof, the memory device comprising:

a plurality of fins formed adjacent to one another, at least one of the fins being doped with a first type of impurities and at least one other one of the fins being doped with a second type of impurities (two fins 206 are shown in Fig. 7b and described in paragraph [0036], but more fins to constitute a six-transistor static random access memory cell – 6-T SRAM – are shown, in the schematic view and top view, in Figs. 8 through 14; first and second type of impurities are used to form n-type FinFETs and p-type FinFETs, paragraphs [0042], [0051] through [0068], particularly paragraphs [0042] and [0060]);

a source region formed at one end of each of the fins (S/D regions or source/drain implants, paragraphs [0047], [0048], and [0064]);

a drain region formed at an opposite end of each of the fins (S/D regions or source/drain implants, paragraphs [0047], [0048], and [0064]);

a gate (“gate structure 404”, paragraphs [0062]-[0063]) formed over two of the plurality of fins (“over” is interpreted broadly);

a wordline (WL, Fig. 8) formed over each of the plurality of fins (Fig. 8 and paragraphs [0051] through [0068], and “over” is interpreted broadly); and

a bitline contact (416, Fig. 14, paragraph [0067]) formed adjacent at least one of the plurality of fins (“adjacent” is interpreted broadly).

Referring to **claim 4**, Fried further discloses that the plurality of fins include four fins (as note above, the fins are for n-type FinFETs and p-type FinFETs for the SRAM).

Referring to **claim 5**, Fried further discloses that a first pair of the plurality of fins is doped with a first type of impurities and the second pair of the plurality of fins is doped with a second type of impurities (as note above, the fins and their respective impurities are for n-type FinFETs and p-type FinFETs for the SRAM, paragraphs [0042], [0051] through [0068], particularly paragraphs [0042] and [0060]).

Referring to **claim 6**, Fried further discloses that the first type of impurities includes n-type impurities and the second type of impurities includes p-type impurities (as note above, the fins and their respective impurities are for n-type FinFETs and p-type FinFETs for the SRAM, paragraphs [0042], [0051] through [0068], particularly paragraphs [0042] and [0060]).

Referring to **claims 18 and 19**, as noted above, Fried discloses that the memory device comprises a static random access memory (SRAM) and that the plurality of fins are formed in pairs (paragraphs [0051] through [0068], particularly paragraph [0051]).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. §103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. **Claims 2-3 and 20** are rejected under 35 U.S.C. §103(a) as being unpatentable over Fried.

Fried discloses a memory device and a method for forming thereof as claimed and as detailed above, including a plurality of fins and that the fins are formed in pairs, but fails to teach the exact sizes as claimed. Specifically, with respect to a width of the fins, Fried's fin width is approximately 3 angstroms to 400 angstroms (.3 nm to 40 nm, paragraph [0040]) instead of about 50 angstroms to 500 angstroms as claimed; with respect to a height of the fins, Fried's fin height is approximately 500 angstroms to 1600 angstroms (50 nm to 160 nm, paragraph [0036]) instead of about 50 angstroms to 500 angstroms as claimed; and as for a distance between fins of each pair of the pairs, Fried is silent. However, since all of the mentioned sizes, specially those for the fin widths (and note that although Fried is silent about the distance between fins of each pair of the pairs of fins, the same mask pattern that determines the width of the fins also determines the distance between fins of each pair of the pairs of fins – Figures 2 through 7), appear to be sub-minimum feature size (paragraph [0057]), or as is increasingly termed as “nano-scale”, and since Applicant has failed to establish the criticality of the claimed sizes, and thus patentability, beside the fact that they are sub-feature sizes which are also disclosed by Fried, and since Fried has not preclude such exact sizes, the change from one size to another would have been obvious to one of ordinary skill in the art at the time the invention was made.

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tu-Tu Ho whose telephone number is (571) 272-1778. The examiner can normally be reached on 6:30 am - 5:00 pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, DAVID NELMS can be reached on (571) 272-1787. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Tu-Tu Ho
October 24, 2004